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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,864	10/17/2003	Emanuel Michael Sachs	EVG-018	9442
42532 7590 07/23/2007 PROSKAUER ROSE LLP ONE INTERNATIONAL PLACE BOSTON, MA 02110			EXAMINER SONG, MATTHEW J	
			ART UNIT 1722	PAPER NUMBER
			MAIL DATE 07/23/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/688,864	SACHS, EMANUEL MICHAEL	
	<b>Examiner</b>	<b>Art Unit</b>	
	Matthew J. Song	1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-73 is/are pending in the application.
- 4a) Of the above claim(s) 1-10, 23-58 and 60-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-22, 59 and 64-73 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/1/2007 has been entered.

### ***Response to Arguments***

2. Applicant's arguments, see page 14-16 of the remarks, filed 5/1/2007, with respect to the rejection(s) of claim(s) 11 under 35 U.S.C. 102 in view of Ciszek, Berkman or Morrison have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Sachs (US 4,627,887).

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 19 and 67 recites the limitation "the mesa crucible" in line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11-16, 18, 19, 21, 22 and 68-73 are rejected under 35 U.S.C. 102(b) as being anticipated by Sachs (US 4,627,887).

Referring to claims 11, 70 and 73, Sachs discloses an apparatus for forming crystalline ribbon comprising a crucible (Abstract). Sachs also discloses a pair of sidewalls extending downward from the edges of the top surface of the crucible (Figs 17-19). Sachs discloses the crucible has a flat top surface which supports a melt, where the only protrusions are the sidewalls (Fig 17), this reads on applicant's substantially flat top surface supporting substantially of a melt. Sachs also discloses capillary retention of the melt (col 15, ln 10 to col 16, ln 55), thus would be capable of applicant's claimed intended use limitation requiring the edges retaining the melt by a capillary attachment to the top surface of the crucible.

Referring to claims 12 and 72, Sachs discloses using a pair of strings 34 and string apertures (col 8, ln 40-67 and Fig 11).

Referring to claim 13-14, the claimed limitation, "the crucible adapts" is an intended use limitation. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the

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intended use, then it meets the claim. The crucible taught by Sachs has all of the claimed structural features, thus would be capable of the claimed intended use.

Referring to claim 15, the pulling of a ribbon is an intended use limitation. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The crucible taught by Sachs has all of the claimed structural features, thus would be capable of the claimed intended use.

Referring to claim 16, Sachs discloses a substantial portion of the melt above the edges of the hole in the middle crucible (Fig 17).

Referring to claim 18, Sachs discloses graphite (col 10, ln 60-65).

Referring to claim 19, Sachs discloses the edges define a recessed top surface (Fig 17-19).

Referring to claim 21, Sachs discloses a means for replenishing (col 10, ln 45-65).

Referring to claim 22, Sachs discloses a heater, heater rods and a thermocouple for controlling temperature (col 14, ln 5-65 and col 3, ln 55 to col 4, ln 10).

Referring to claims 68-69, Sachs discloses a crucible having a substantially flat top surface, a pair of sidewalls extending downward from opposing edges of the top surface and a means for pulling 160 a crystal ribbon (col 11, ln 25-65). In regards to the "at least a portion of the boundary profile is concave downward limitation" and "the forming an inflection point in at least a portion of the a cross sectional boundary profile of the melt", these limitation is merely an intended use limitation. A recitation of the intended use of the claimed invention must result in a

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structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The crucible taught by Sachs has all of the claimed structural features, thus would be capable of the claimed intended use. Boundary profile is a function of thermal conditions and can be created into a desired shape by desired heating, note column 8, lines 20-40.

Referring to claim 70, Sachs discloses a melt above the edges of the crucible (Fig 17).

7. Claims 65-67 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagai et al (US 5,902,395).

Nagai et al discloses an apparatus for replenishing a crucible comprising feeding apparatus (Abstract). The feeding apparatus comprising a feed pipe 10 and the feed pipe has a mechanism for upward sliding movement (col 12, ln 60-67, col 10, ln 1-50 and Fig 7I), this reads on applicant's movable feeder in a first and second direction along the crucible because the feeder is raised or lowered on an angle according to Fig 7I. Nagai et al also discloses a vibration feeder (col 3, ln 25-40 and col 9, ln 15-65), this reads on applicant's vibration means for vibrating the feeder. It is noted that claim 65 recites a "means for vibrating the feeder", however no explicit means are disclosed in the specification.

Referring to claim 66, Nagai et al discloses feed pipe.

Referring to claim 67, Nagai et al discloses the feed pipe can be positioned to a distance of 0 mm from the crucible (col 12, ln 15-30), which inherently is less than diameter of the crucible.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sachs (US 4,627,887) as applied to claims 11-16, 18, 19, 21, 22 and 68-73 above,

Sachs discloses all of the limitations of claim 17, as discussed previously, except more than one pair of apertures. Sachs discloses a single pair of holes for a pair of strings. The mere duplication of parts has no patentable significance unless a new and unexpected result is produced (MPEP 2144.04). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Sachs by adding one or more additional pair of apertures and strings to produce more crystalline ribbon, thereby improving productivity.

Referring to claim 20, Sachs does not disclose the width of the crucible is between 15 and 30 mm. Changes in size are held to be prima facie obvious (MPEP 2144.04). Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Sachs to have a desired size of 15-30 mm to produce a ribbon of desired size.

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10. Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sachs (US 4,627,887) as applied to claims 11-16, 18, 19, 21, 22 and 68-73 above, and further in view of Little (US 4,402,786).

Sachs teaches all of the limitations of claim 59, as discussed previously, except an insulator and a moving means for moving the insulator.

In a method of forming crystal ribbons, note entire reference, Little teaches modifying the temperature distribution along the solid/liquid boundary during growth. (col 2, ln 1-45). Little teaches using a heat shield assembly which can be moved relative to each other to ensure the growing body will have a constant cross-section by controlling the temperature distribution. (col 2, ln 1-45).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Sachs by using the movable heat shield taught by Little to ensure the growing body will have a constant cross-section by controlling the temperature distribution.

#### ***Response to Arguments***

11. Applicant's arguments with respect to claims 11-22, 59 and 65-73 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J Song  
Examiner  
Art Unit 1722

  
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MJS  
July 18, 2007